UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 6,860,015 B2
APPLICATION NO. : 09/975138
DATED : March 1, 2005
INVENTOR(S) : Neal M. Muylaert and Robert T. Loftus

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Delete Title page and substitute attached Title page therefor.

(75) Inventors: Neal M. Muylaert -- and Robert T. Loftus --

Delete Drawing Sheets 1-3 and substitute attached sheets 1-3 therefor.

at col. 2, line 28, after "exploded" please insert -- cross sectional --;

at col. 2, line 59, please replace "yolk" with -- yoke --;

at col. 2, line 61, please replace "yolk" with -- yoke --;

at col. 2, line 63, after "exploded" please insert -- cross sectional --;

at col. 3, lines 5-6, please replace "element, 64 and 66 for the outboard bearing element," with -- element 34, 62 and 67 for the outboard bearing element 32, --;

at col. 3, line 16, after "inner race" please insert -- 64 and 62 -- and after "outer race" please insert -- 66 and 67 --;

at col. 3, line 17, please replace "32" with -- 34 -- and please replace "34" with -- 32, --;

at col. 3, line 19, please replace "32" with -- 34 --;

at col. 3, line 21, please replace "32" with -- 34 --;

at col. 3, line 23, please replace "32" with -- 34 --;

at col. 3, line 24, please replace "62" with -- 64 --;

at col. 3, line 27, after "outer race" please insert -- 66 --;

at col. 3, line 28, please replace "67" with -- 34 -- and after "surface" please insert -- 55 --;

at col. 3, line 32, please replace "40" with -- 30 --;

at col. 3, line 33, please replace "outboard" with -- inboard -- and "34" with -- 32 --;

at col. 3, line 34, please replace "outboard" with -- inboard --;

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at col. 3, line 35, please replace "34" with -- 32 --;

at col. 3, line 36, please replace "inboard" with -- outboard -- and "32" with -- 34 --;

at col. 3, line 39, please replace "34" with -- 32 --;

at col. 3, line 40, after "inner race" please insert -- 62 --;

at col. 3, line 41, please replace "outboard" with -- inboard -- and "64" with -- 32 --;

at col. 3, line 42, after "inner race" please insert -- 64 -- and please replace "64" with -- 34 --;

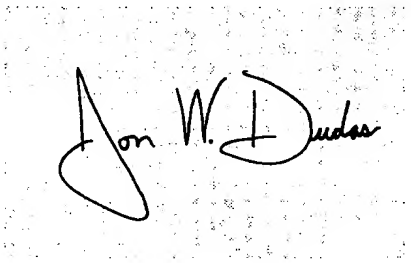
at col. 3, line 44, after "outer race" please insert -- 67 --;

at col. 3, line 45, please replace "outboard bearing 66" with -- inboard bearing 32 -- and after "inner surface" please insert -- 55 --; and

at col. 3, line 61, please replace "as" with -- with --.

Signed and Sealed this

Fourteenth Day of November, 2006



JON W. DUDAS
Director of the United States Patent and Trademark Office

US006860015B2

(12) **United States Patent**
Muylaert

(10) **Patent No.: US 6,860,015 B2**
(45) **Date of Patent: Mar. 1, 2005**

(54) **METHOD OF FORMING OPPOSING INTERNALLY PRELOADED CONICAL ELASTOMERIC BEARING ASSEMBLY**

(75) Inventor: **Neal M. Muylaert**, Apache Junction, AZ (US)

(73) Assignee: **The Boeing Company**, Chicago, IL (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 278 days.

(21) Appl. No.: **09/975,138**

(22) Filed: **Oct. 10, 2001**

(65) **Prior Publication Data**

US 2003/0066194 A1 Apr. 10, 2003

(51) **Int. Cl.**[7] **B21D 53/10**
(52) **U.S. Cl.** **29/898.09**; 29/898.07; 403/228
(58) **Field of Search** 29/898.054, 898.07, 29/898.09, 894.361; 384/222, 235, 236; 403/132, 133, 228

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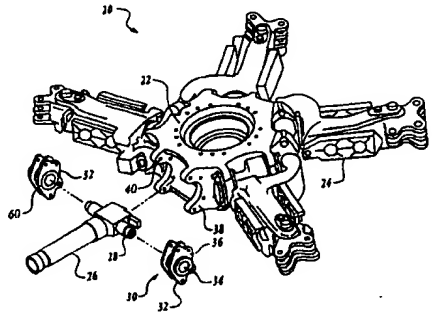
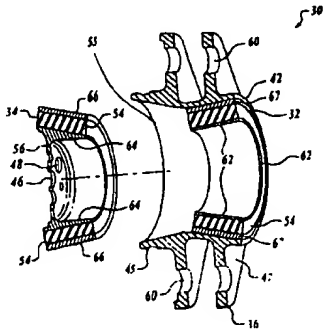
Primary Examiner—Eric Compton
(74) *Attorney, Agent, or Firm*—Black Lowe & Graham PLLC

(57) **ABSTRACT**

A method is provided for producing an elastomeric conical flap bearing assembly for rotary aircraft including an inboard bearing element and outboard bearing element disposed within an outer housing. The outer housing has an outer surface configured with a plurality of radially extending flange elements. The outer housing has an inner surface configured to receive tapered conical bearing elements. A tapered conical elastomeric inboard bearing element is inserted into its outer housing and is bonded to the inner surface. A tapered conical elastomeric outboard bearing element is inserted into the outer housing, wherein the conical tapers of the respective bearing elements are directed in opposing directions. The bearing elements are press-fit together and the outer surface of the outboard bearing is bonded to the inner surface of the outer housing forming a bearing assembly. Simultaneously, an axial pre-load is applied to the bearing assembly. A plurality of bearing coupler lugs are attached to the bearing assembly.

20 Claims, 3 Drawing Sheets





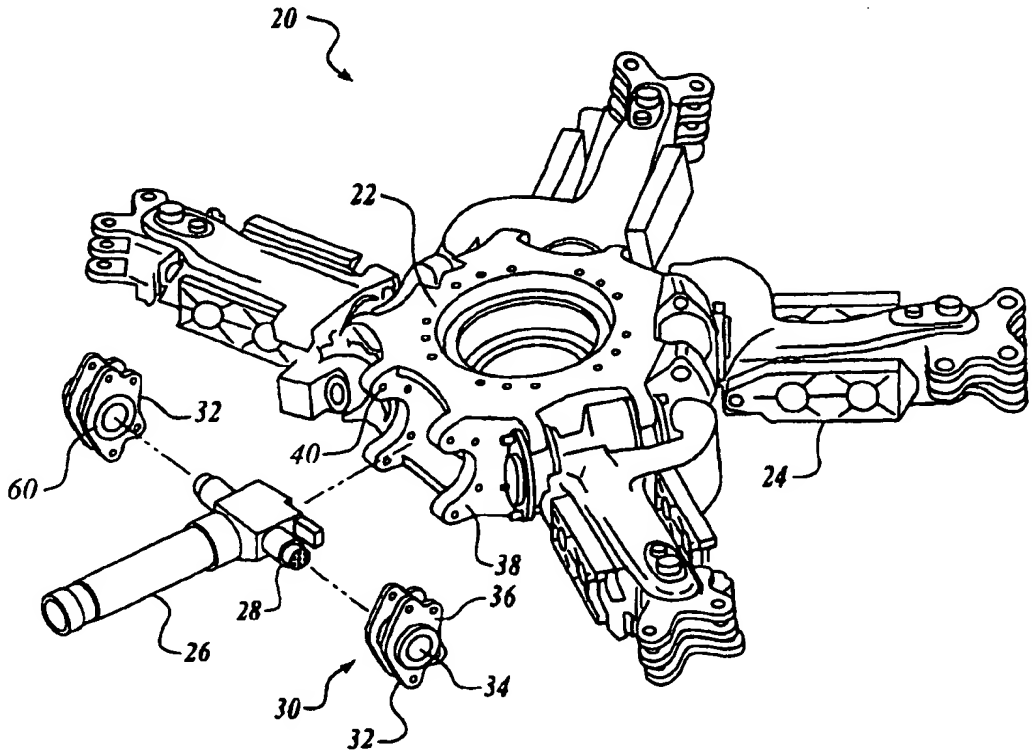


Fig. 1.

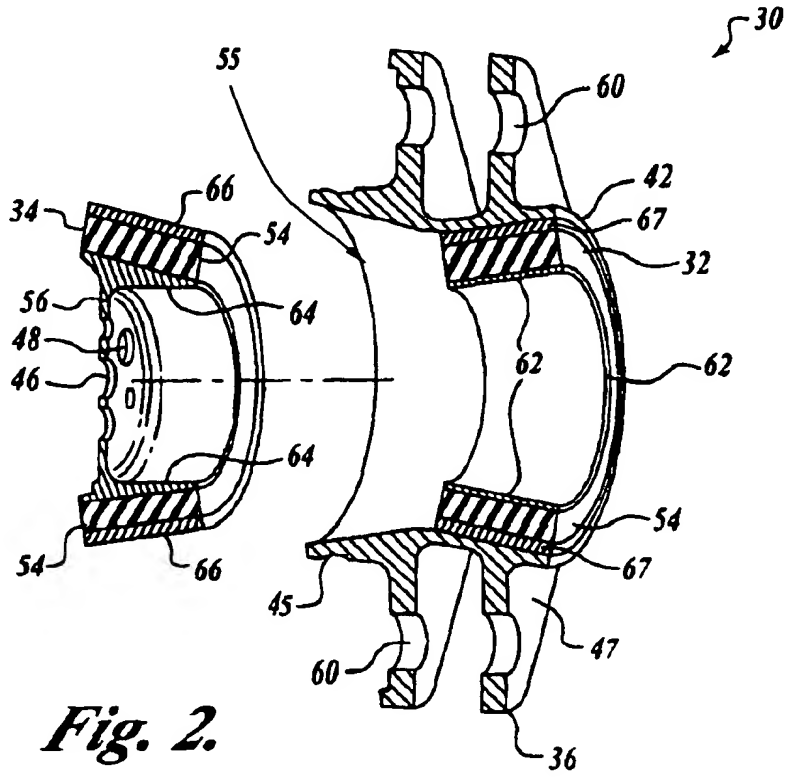

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Fig. 2.

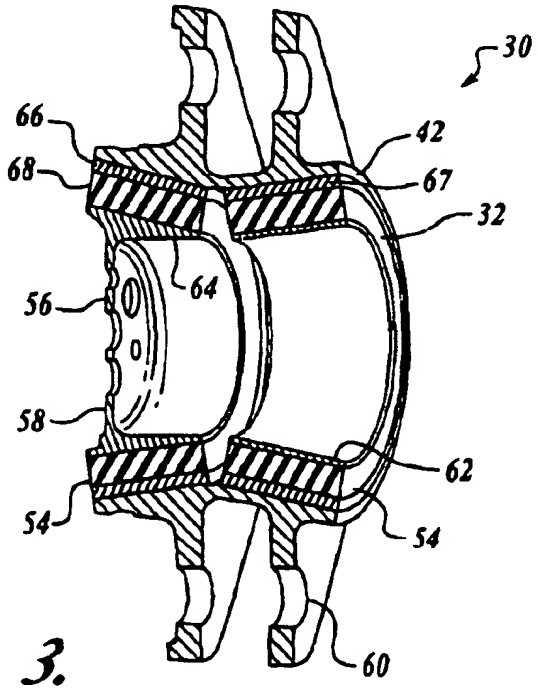
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Fig. 3.

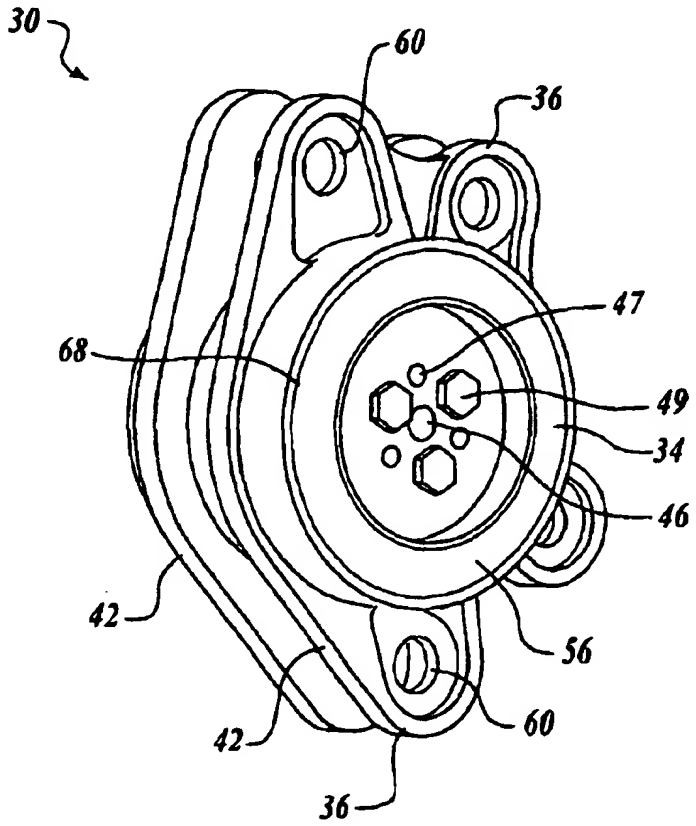

Fig. 4.